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EXAMINER	
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ART UNIT	PAPER NUMBER
1753	8

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/768,950	HOWER ET AL.
	Examiner	Art Unit
	ALEX NOGUEROLA	1753

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 May 2003*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-26 and 39-46* is/are pending in the application.

4a) Of the above claim(s) *28-37* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-22,24-26,39-41* is/are rejected.

7)☒ Claim(s) *23 and 42-46* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *24 January 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

Response to Amendments and Arguments

1. Applicant states, "many of the claims have been amended to include a membrane limitation which none of the cited references disclose disposed in a three-dimensional, thin film well." The examiner respectfully disagrees. As indicated in the rejections below, Gau, Gratzl, and Inoue each teach having at least one membrane disposed in a three-dimensional, thin film well.

Status of Objections and Rejections Applied in the Office action of February 12, 2003

2. All previous objections and rejections are withdrawn.

Claim Objections

3. Claim 25 is objected to because of the following informalities: in line 3 "to" should be ---- of --.

4. Appropriate correction is required.

Claim Rejections - 35 USC § 102

5. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

1. Claims 1, 3, 5-7, 10, 11, 17-19, 21, 22, and 24-26 are rejected under 35 U.S.C. 102(e) as being anticipated by Gau (WO 01/83674 A1).

Addressing Claim 1, Gau teaches a micromachined device (the abstract), comprising

a substrate having an upper surface (substrate, not labeled, upon which the electrodes are located shown in Figures 2, 7(b), 12, and 13, on pages 36, 38, 8/19, and 8/19, respectively);

a three-dimensional, thin film well patterned at the upper surface of the substrate wherein the well is capable of receiving and retaining a known quantity of liquid (a well is shown in Figures 2, 7(b), 12, and 13, on pages 36, 38, 8/19, and 8/19, respectively. Note that the electrodes also act as wells. That the wells are capable of retaining a known quantity of liquid at the desired site through surface tension is implied by page 10, lines 24-34, which teaches that the area surrounding the wells and electrodes is hydrophobic so as to contain the liquid. Also see page 14, lines 3-5, which teaches using surface tension to confine liquid, and page 15, lines 27-32, which teaches that the hydrophobic substrate surface will confine liquid administered by pipette.); and

a membrane disposed in the three-dimensional, thin film well (using gel to support reagent molecules within the well is disclosed in page 5, line 36 – page 6, line 5 and in page 15, lines 16-26).

Addressing Claim 3, Gau teaches a micromachined device (the abstract), comprising

a substrate having an upper surface (substrate, not labeled, upon which the electrodes are located shown in Figures 2, 7(b), 12, and 13, on pages 36, 38, 8/19, and 8/19, respectively);

an array of three-dimensional, thin film wells patterned at the upper surface of the substrate (the abstract; Figures 1 and 2 on page 53 and Figure 23 on page 14/19) wherein each of the wells is capable of receiving and retaining a known quantity of liquid (a well is shown in Figures 2, 7(b), 12, and 13, on pages 36, 38, 8/19, and 8/19, respectively. Note that the inner electrode of the concentric electrodes also act as a well. That the wells are capable of retaining a known quantity of liquid at the desired site through surface tension is implied by page 10, lines 24-34, which teaches that the area surrounding the wells and electrodes is hydrophobic so as to contain the liquid. Also see page 14, lines 3-5, which teaches using surface tension to confine liquid, and page 15, lines 27-32, which teaches that the hydrophobic substrate surface will confine liquid administered by pipette.); and

a set of membranes disposed in the three-dimensional, thin well (using gel to support reagent molecules within the well is disclosed in page 5, line 36 – page 6, line 5 and in page 15, lines 16-26).

Addressing Claim 5, wells in the form of rings are shown in Figures 2, 7(b), 12, and 13.

Addressing Claim 6, that the device is a microsensor may be seen from the abstract.

Addressing Claim 7, that the microsensor is a solid–state, liquid chemical sensor may be seen from the abstract.

Addressing Claim 10, Gau's device is to be used for biomedical testing (the abstract and page 1, lines 9-14).

Addressing Claim 11, page 16, line 23 – page 17, line 9 describe how the wells are made by photo patterning.

Addressing Claims 17 and 18, Gau teaches a silicon wafer in page 16, lines 23-26.

Addressing Claim 19, Gau teaches patterning wells on an oxide layer, which serves electrical insulation, above the silicon wafer (page 16, lines 33-35).

Addressing Claim 21, Gau teaches a potentiometric embodiment in page 2, line. 24 to page 3, line 3.

Addressing Claim 22, having the sensor configured as an integrated ion sensor is disclosed in the abstract.

Addressing Claim 24, Gau teaches a method of making a micromachined device (the abstract; Figures 2, 7(b), 12, and 13, on pages 36, 38, 8/19, and 8/19, respectively) comprising

providing a substrate having a layer of radiation sensitive material formed thereon (page 16, lines 23 to page 17, line 1);

patterning at least one three-dimensional, thin film well from the layer of material wherein the at least one wells is capable of receiving and retaining a known quantity of liquid (page 16, lines 23-28; page 16, line 36 to page 17, line 9; and Figures 12, and 13, on pages 36, 38, 8/19, and 8/19, respectively. That the well is capable of retaining a known quantity of liquid at the desired site through surface tension is implied by page 10, lines 24-34, which teaches that the area surrounding the wells and electrodes is hydrophobic so as to contain the liquid. Also see page 14, lines 3-5, which teaches using surface tension to confine liquid, and page 15, lines 27-32, which teaches that the hydrophobic substrate surface will confine liquid administered by pipette); and

dispensing a first membrane in the three-dimensional well (using gel to support reagent molecules within the well is disclosed in page 5, line 36 – page 6, line 5 and in page 15, lines 16-26).

Addressing Claim 25, as seen from Figures 12 and 17-19 a three-dimensional thin film well is patterned concentric to the at least one well at the same time as patterning the at least one well.

Addressing Claim 26, since the layer is made with photo-resist it is photo-patternable (page 16, line 36 to page 17, line 9).

2. Claims 1, 3, 5, 10, and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Inoue et al. (US 5,955,352).

Addressing Claim 1, Inoue et al. teach a micromachined device (the abstract; Figures 1-7; and col. 8, ll. 25-48), comprising

a substrate (element 1 in the figures) having an upper surface; and

a three-dimensional, thin film well patterned at the upper surface of the substrate wherein the well is capable of receiving and retaining a known quantity of liquid (element 11 in Figures 4-7 corresponds to the claimed thin film well. Note that retaining liquid as claimed is taught by Figure 6, which shows a drop of liquid retained in a sample holding portion and col. 5, ll. 45-62 and col. 6, ll. 25-36, which teaches that the upper surface of the substrate is hydrophobic expect for the sample-holding portions so that a liquid drop may be retained by surface tension. Retaining a known quantity of sample is taught in col. 7, ll. 1-7); and

a membrane disposed in the three-dimensional, thin film well (note membrane 15 in Figure 7 and see col. 10, l. 58-62).

Addressing Claim 3, Inoue et al. teach a micromachined device (the abstract), comprising

a substrate having an upper surface (the abstract; Figures 1-7; and col. 8, ll. 25-48);

an array of three-dimensional, thin film wells patterned at the upper surface of the substrate (Figures 1-3) wherein each of the wells is capable of receiving and retaining a known quantity of liquid (element 11 in Figures 4-7 corresponds to the claimed thin film well. Note that

retaining liquid as claimed is taught by Figure 6, which shows a drop of liquid retained in a sample holding portion and col. 5, ll. 45-62 and col. 6, ll. 25-36, which teaches that the upper surface of the substrate is hydrophobic expect for the sample-holding portions so that a liquid drop may be retained by surface tension. Retaining a known quantity of sample is taught in col. 7, ll. 1-7.); and

a set of membranes disposed in the array of three-dimensional, thin film wells, respectively (note membrane 15 in Figure 7 and see col. 10, l. 58-62).

Addressing Claim 5, wells in the form of rings are shown in Figures 1-7.

Addressing Claim 10, that the device is a biomedical test plate is implied by col. 2, ll. 16-26, which teaches using the device for performing clinical tests or microbiological tests.

Addressing Claim 20, Inoue et al. disclose various materials other than a semiconductor material from which the substrate may be made, such as plastic, papers, or metals (col. 5, ln. 64 – col. 6, ln. 8).

3. Claims 1, 3, 5-7, 9, 20, and 21 are rejected under 35 U.S.C. 102(b) as being anticipated by Gratzl et al. (WO 98/13675 A1).

Addressing Claim 1, Gratzl et al. teach a micromachined device (the abstract), comprising

a substrate (element 12 in Figures 1 and 6) having an upper surface;

a three-dimensional, thin film well patterned at the upper surface of the substrate wherein the well is capable of receiving and retaining a known quantity of liquid (element 18 in Figures 1 and 6 and page 11, line 26 to page 12, line 24); and

a membrane disposed in the three-dimensional, thin film well (note membrane 28 in Figures 1 and 5 and see page 12, lines 25-35).

Addressing Claim 3, Gratzl et al. teach a micromachined device (the abstract), comprising

a substrate (element 12 in Figures 1 and 6) having an upper surface;

an array of three-dimensional, thin film wells patterned at the upper surface of the substrate (an array of wells is implied or suggested by page 22, lines 3-21 and Figure 8, which teaches having more that one well site wherein each of the wells is capable of receiving and retaining a known quantity of liquid (for an individual well note element 18 in Figures 1 and 6 and page 11, line 26 to page 12, line 24)); and

a set of membranes disposed in the array of three-dimensional, thin film wells, respectively (note membrane 28 in Figures 1 and 5 and see page 12, lines 25-35).

Addressing Claim 5, that that wells are in the form of rings are shown in Figures 3, 5, and 8.

Addressing Claim 6, that the device is a microsensor may be seen from the abstract.

Addressing Claim 7, that the microsensor is a solid–state, liquid chemical sensor may be seen from the abstract.

Addressing Claim 9, embodiments in which the microsensor is an optical sensor are disclosed on page 14, line 1 – page 16, line 2 and page 17, lines 28-32.

Addressing Claim 20, Gratzl et al. teach a Pyrex substrate (page 12, lines 9-11).

Addressing Claim 21, Gratzl et al. teach using the device for potentiometric sensing in page 18, lines 25-28.

4. Claims 1 and 2 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Gumbrecht et al. (US 5,376,255).

Addressing Claim 1, Gumbrecht et al. teach a micromachined device (the abstract and col. 3, ll. 18-25), comprising

a substrate having an upper surface (element 10 in Figure 1a);

a three-dimensional, thin film well patterned at the upper surface of the substrate wherein the well is capable of receiving and retaining a known quantity of liquid (elements 14 and 15 in Figure 1a); and

a membrane disposed in the three-dimensional, thin film well (elements 13 and 19 in Figure 1a. Also see claim 1; col. 3, ln. 31; and col. 3, ll. 1-17).

Addressing Claim 2, Gumbrecht et al. teach a micromachined device (the abstract and claim 1), comprising

a substrate having an upper surface (element 2 in Figure 1);

a first three-dimensional, thin film well patterned at the upper surface of the substrate wherein the first well is capable of receiving and retaining a first known quantity of liquid (element 14 in Figure 1a);

a second three-dimensional, thin film well patterned at the upper surface of the substrate wherein the second well is capable of receiving and retaining a second known quantity of liquid (element 15 in Figure 1a);

an internal membrane disposed in the first three-dimensional, thin film well (element 13 in Figure 1a. Also see claim 1 and col. 3, ln. 31); and

an external membrane disposed in the second three-dimensional, thin film well (element 19 in Figure 1a. Also see claim 1 and col. 3, ll. 1-17).

5. Claims 1 and 2 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by Stanzel et al. (US 6,440,296 B1).

Addressing Claim 1, Stanzel et al. teach a micromachined device (the abstract and claim 1), comprising

a substrate having an upper surface (element 2 in Figure 1);

a three-dimensional, thin film well patterned at the upper surface of the substrate wherein the well is capable of receiving and retaining a known quantity of liquid (elements 3 and 7 in Figure 1); and

a membrane disposed in the three-dimensional, thin film well (elements 5 and 6 in Figure 1. Also see claim 5 and col. 3, ll. 34-46).

Addressing Claim 2, Stanzel et al. teach a micromachined device (the abstract and claim 1), comprising

a substrate having an upper surface (element 2 in Figure 1);

a first three-dimensional, thin film well patterned at the upper surface of the substrate wherein the first well is capable of receiving and retaining a first known quantity of liquid (element 3 in Figure 1);

a second three-dimensional, thin film well patterned at the upper surface of the substrate wherein the second well is capable of receiving and retaining a second known quantity of liquid (element 7 in Figure 1);

an internal membrane disposed in the first three-dimensional, thin film well (element 5 in Figure 1. Also see claim 5 and col. 3, ll. 34-46); and

an external membrane disposed in the second three-dimensional, thin film well (element 6 in Figure 1. Also see claim 5 and col. 3, ll. 34-46).

Claim Rejections - 35 USC § 103

6. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

7. Claims 39-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gau (WO 01/83674 A1) in view of Lev et al. (US 5,403,462) and Karube et al. (US 4,975,175).

Gau teaches a method of making a micromachined device (the abstract; Figures 2, 7(b), 12, and 13, on pages 36, 38, 8/19, and 8/19, respectively) comprising

providing a substrate having a layer of radiation sensitive material formed thereon (page 16, lines 23 to page 17, line 1);

patterning at least one three-dimensional, thin film well from the layer of material wherein the at least one wells is capable of receiving and retaining a known quantity of liquid (page 16, lines 23-28; page 16, line 36 to page 17, line 9; and Figures 12, and 13, on pages 36, 38, 8/19, and 8/19, respectively. That the well is capable of retaining a known quantity of liquid at the desired site through surface tension is implied by page 10, lines 24-34, which teaches that the area surrounding the wells and electrodes is hydrophobic so as to contain the liquid. Also see

page 14, lines 3-5, which teaches using surface tension to confine liquid, and page 15, lines 27-32, which teaches that the hydrophobic substrate surface will confine liquid administered by pipette); and

dispensing a first membrane in the three-dimensional well (using gel to support reagent molecules within the well is disclosed in page 5, line 36 – page 6, line 5 and in page 15, lines 16-26).

Gau does not describe the solution from which the membrane is made. However, as seen from Lev et al. and Heller et al. at the time of the invention gels for using electrochemical biosensors were made from polymeric solutions, which could be aqueous or solvent-based, depending on the composition of the gel. See in Lev et al. col. 1, ln. 19 – col. 2, ln. 3 and in Karube et al. see col. 5, ln. 60 – col. 6, ln. 68.

8. Claims 3-8, 10-14, and 17-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gumbrecht et al. (US 5,376,255).

Addressing Claim 3, Gumbrecht et al. teach a micromachined device (the abstract and col. 3, ll. 18-25), comprising

a substrate having an upper surface (element 10 in Figure 1a);

a three-dimensional, thin film well patterned at the upper surface of the substrate wherein the well is capable of receiving and retaining a known quantity of liquid (elements 14 and 15 in Figure 1a); and

a membrane disposed in the three-dimensional, thin film well (elements 13 and 19 in Figure 1a. Also see claim 1; col. 3, ln. 31; and col. 3, ll. 1-17).

Gumbrecht et al. do not mention an array of such three-dimensional thin film wells; however, providing an array of such wells is just multiplication of parts, which has been held obvious. St. Regis Paper Co. v. Bemis Co., Inc., 193 USPQ 8, 11. Furthermore, it would have been obvious to one with ordinary skill in the art at the time the invention was made to provide an array of three-dimensional, thin film wells in Gumbrecht et al. so that several different analytes can be measured (see col.3, ll. 52-65).

Addressing Claim 4, Gumbrecht et al. teach a micromachined device (the abstract and claim 1), comprising

a substrate having an upper surface (element 2 in Figure 1);

a first three-dimensional, thin film well patterned at the upper surface of the substrate wherein the first well is capable of receiving and retaining a first known quantity of liquid (element 14 in Figure 1a);

a second three-dimensional, thin film well patterned at the upper surface of the substrate wherein the second well is capable of receiving and retaining a second known quantity of liquid (element 15 in Figure 1a);

an internal membrane disposed in the first three-dimensional, thin film well (element 13 in Figure 1a. Also see claim 1 and col. 3, ln. 31); and

an external membrane disposed in the second three-dimensional, thin film well

(element 19 in Figure 1a. Also see claim 1 and col. 3, ll. 1-17).

Gumbrecht et al. do not mention a first array of the first three-dimensional thin film wells and a second array of the second three-dimensional thin film wells; however, providing a first array of such first wells and a second array of such second wells is just multiplication of parts, which has been held obvious. St. Regis Paper Co. v. Bemis Co., Inc., 193 USPQ 8, 11. Furthermore, it would have been obvious to one with ordinary skill in the art at the time the invention was made to provide a first array of the first three-dimensional thin film wells and a second array of the second three-dimensional thin film wells so that several different analytes can be measured (see col.3, ll. 52-65).

Addressing Claim 5, as seen from Figures 1a and 1b, the wells form rings.

Addressing Claims 6-8, as seen from the abstract and col. 3, ll. 52-66 the device is a gas microsensor that can detect gas in a liquid sample.

Addressing Claim 10, the device can detect oxygen and carbon dioxide, which are important biomedical compounds.

Addressing Claim 11, Gumbrecht et al. disclose that the wells can be made from polyimide (see Applicant's claim 14).

Addressing Claims 12-14, Gumbrecht et al. teach a micromachined device (the abstract and claim 1), comprising

a substrate having an upper surface (element 2 in Figure 1); and

a three-dimensional, thin film well patterned at the upper surface of the substrate wherein the first well is capable of receiving and retaining a first known quantity of liquid (element 14 in Figure 1a).

Gumbrecht et al. disclose that the wells can be made from polyimide (see Applicant's claim 14).

Gumbrecht et al. do not mention an array of such three-dimensional thin film wells; however, providing an array of such wells is just multiplication of parts, which has been held obvious. St. Regis Paper Co. v. Bemis Co., Inc., 193 USPQ 8, 11. Furthermore, it would have been obvious to one with ordinary skill in the art at the time the invention was made to provide an array of three-dimensional, thin film wells in Gumbrecht et al. so that several different analytes can be measured (see col.3, ll. 52-65).

Addressing Claims 17 and 18, Figure 1a shows a substrate (10), which can be silicon.

Addressing Claim 19, although not mention it would have been obvious to one with ordinary skill in the art at the time the invention was made to provide to an insulating layer on the substrate to protect it from contamination by the sample (and thus possible contamination for subsequent samples) or corrosion.

Addressing Claim 20, barring evidence to the contrary, such as unexpected results, the type of material from which the substrate will be made will depend on cost, mechanical strength, and electrical resistivity. Note that aluminum oxide, quartz, and silicon are disclosed in col. 2, ll. 29-39.

Addressing Claim 21, that the device is capable of potentiometric measurements may be seen from col. 2, ll. 46-54, which teaches providing a redox sensitive reference electrode. Note that the device can detect gas in a liquid sample. See col. 3, ll. 52-66.

9. Claims 3-7, 10-14, and 17-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stanzel et al. (US 6,440,296 B1).

Addressing Claim 3, Stanzel et al. teach a micromachined device (the abstract and claim 1), comprising

a substrate having an upper surface (element 2 in Figure 1);

a three-dimensional, thin film well patterned at the upper surface of the substrate wherein the well is capable of receiving and retaining a known quantity of liquid (elements 3 and 7 in Figure 1); and

a membrane disposed in the three-dimensional, thin film well (elements 5 and 6 in Figure 1. Also see claim 5 and col. 3, ll. 34-46).

Stanzel et al. do not mention an array of such three-dimensional thin film wells; however, providing an array of such wells is just multiplication of parts, which has been held obvious. St. Regis Paper Co. v. Bemis Co., Inc., 193 USPQ 8, 11. Furthermore, it would have been obvious to one with ordinary skill in the art at the time the invention was made to provide an array of three-dimensional, thin film wells in Stanzel et al. so that several different analytes can be measured (see col.3, ll. 24-28).

Addressing Claim 4, Stanzel et al. teach a micromachined device (the abstract and claim 1), comprising

a substrate having an upper surface (element 2 in Figure 1);

a first three-dimensional, thin film well patterned at the upper surface of the substrate wherein the first well is capable of receiving and retaining a first known quantity of liquid (element 3 in Figure 1);

a second three-dimensional, thin film well patterned at the upper surface of the substrate wherein the second well is capable of receiving and retaining a second known quantity of liquid (element 7 in Figure 1);

an internal membrane disposed in the first three-dimensional, thin film well (element 5 in Figure 1. Also see claim 5 and col. 3, ll. 34-46); and

an external membrane disposed in the second three-dimensional, thin film well (element 6 in Figure 1. Also see claim 5 and col. 3, ll. 34-46).

Stanzel et al. do not mention a first array of the first three-dimensional thin film wells and a second array of the second three-dimensional thin film wells; however, providing a first array

of such first wells and a second array of such second wells is just multiplication of parts, which has been held obvious. St. Regis Paper Co. v. Bemis Co., Inc., 193 USPQ 8, 11. Furthermore, it would have been obvious to one with ordinary skill in the art at the time the invention was made to provide a first array of the first three-dimensional thin film wells and a second array of the second three-dimensional thin film wells in Stanzel et al. so that several different analytes can be measured (see col.3, ll. 24-28).

Addressing Claim 5, as seen from Figures 1 and 2, the wells form rings.

Addressing Claims 6 and 7, as seen from the abstract the device is a liquid chemical microsensor.

Addressing Claim 10, the device can be used for taking measurements on blood, which is an important biomedical substance.

Addressing Claim 11, Stanzel et al. disclose that the wells can be made from polyimide (see Applicant's claim 14).

Addressing Claims 12-14, Stanzel et al. teach a micromachined device (the abstract and claim 1), comprising

a substrate having an upper surface (element 2 in Figure 1); and

a three-dimensional, thin film well patterned at the upper surface of the substrate wherein the well is capable of receiving and retaining a known quantity of liquid (elements 3 and 7 in Figure 1).

Stanzel et al. also disclose that the wells can be made from polyimide.

Stanzel et al. do not mention an array of such three-dimensional thin film wells; however, providing an array of such wells is just multiplication of parts, which has been held obvious. St. Regis Paper Co. v. Bemis Co., Inc., 193 USPQ 8, 11. Furthermore, it would have been obvious to one with ordinary skill in the art at the time the invention was made to provide an array of three-dimensional, thin film wells in Stanzel et al. so that several different analytes can be measured (see col.3, ll. 24-28).

Addressing Claims 17, 18, and 20, barring evidence to the contrary, such as unexpected results, the type of material from which the substrate will be made will depend on cost, mechanical strength, and electrical resistivity.

Addressing Claim 19, although not mention it would have been obvious to one with ordinary skill in the art at the time the invention was made to provide to an insulating layer on the substrate to protect it from contamination by the sample (and thus possible contamination for subsequent samples) or corrosion.

Addressing Claim 21, that the device is capable of potentiometric measurements may be seen from col. 2, ll. 27-31, which teaches that the device can be used for electrochemical measurements.

10. Claims 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gumbrecht et al. (US 5,376,255) as applied to claims 3-8, 10-14, and 17-21 above, and further in view of Reincke et al. (US 6,251,567 B1). Gumbrecht et al. do not mention using epoxy, particularly SU8, to form the wells. However SU8 epoxy was a known material for making microstructures at the time of the invention (col. 1, ll. 52-67 in Reincke et al.). It would have been obvious to one with ordinary skill in the art at the time the invention was made to use SU8 epoxy in the invention of Gumbrecht et al. because as taught by Reincke et al. SU8 epoxy can yield deep structures with short irradiation times a high aspect ratio. See col. 4, ln. 66 – col. 5, ln. 5.

11. Claims 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stanzel et al. (US 6,440,296 B1) as applied to claims 3-7, 10-14, and 17-21 above, and further in view of Reincke et al. (US 6,251,567 B1). Stanzel et al. do not mention using epoxy, particularly SU8, to form the wells. However SU8 epoxy was a known material for making microstructures at the

time of the invention (col. 1, ll. 52-67 in Reincke et al.). It would have been obvious to one with ordinary skill in the art at the time the invention was made to use SU8 epoxy in the invention of Stanzel et al. because as taught by Reincke et al. SU8 epoxy can yield deep structures with short irradiation times a high aspect ratio. See col. 4, ln. 66 – col. 5, ln. 5.

Allowable Subject Matter

12. Claims 23 and 42-46 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

13. The following is a statement of reasons for the indication of allowable subject matter:

a) Claim 23 requires that each well includes a side wall having an outside corner with a small radius to prevent the liquid from flowing down outside the sidewall. In the cited references the outside corner of each well is formed by perpendicular walls;

b) Claim 42: Gau et al. do not disclose an optical membrane. It would not have been obvious to provide one since they teach an electrochemical sensor;

c) Claim 43: as seen in Figure 8 of Gau et al. does not dispense a second membrane solution into the thin film well. The electrolyte solution drop expands to reach the outside concentric ring when substrate is added to the electrolyte drop; and

d) Claims 44-46 depend from allowable Claim 43.

Final Rejection

14. Applicant's amendment necessitated the new grounds of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ALEX NOGUEROLA whose telephone number is (703) 305-5686. The examiner can normally be reached on M-F 8:30 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, NAM NGUYEN can be reached on (703) 308-3322. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Alex Noguerola
August 9, 2003

NAM NGUYEN
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